

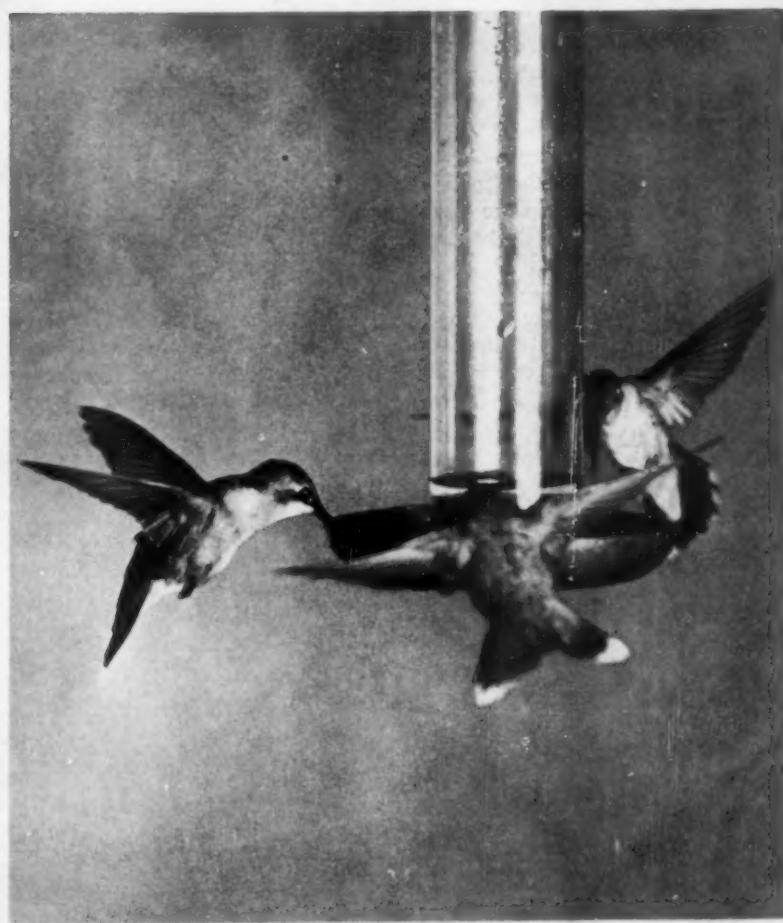
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



AUGUST 22, 1936

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See Page 120

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DO YOU KNOW?

Eskimos now raise pigs in the Arctic.

Concrete roads are constructed thicker at the edges than in the center.

Doctors of ancient Egypt described the knee-cap as "the round cake of the knee."

In Soviet Russia, 43 per cent of the entire present population was born after the revolution in 1917.

One person in ten in this country suffers from hay fever or some other allergic disease, such as hives, asthma, or rose fever.

A tendency to stoutness may run in a family, judging by a physician's investigation of the inheritance of obesity in women.

Checking up on the food requirements of mosquitoes in the larval stage, it is found that they do not appear to need vitamins A, B, C, D, and E.

Although red clover is mentioned a number of times in colonial history, botanists cannot find out who brought the first red clover to the New World.

Experiments show that poison ivy may emit poison from the leaves or through pores in the stem or from the epidermis of the roots.

Children in a Kentucky school are eating fewer sweets and drinking more milk, since they have observed effects of a poorly balanced diet on white rats.

Natural water bottles—pieces of quartz in which water can be heard gurgling if the "bottle" is shaken—are interesting geology exhibits in a museum.

By crossing a Russian wild boar with country pigs, German scientists have produced a completely new breed of pig, which is strongly resistant to disease.

A feature of Soviet education is building children's ports, where children take charge of ships and study marine biology.

A new kind of laboratory—a vegetable laboratory—has been opened near Charleston, S. C., by the Federal Government and 13 cooperating states.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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ARCHAEOLOGY

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HISTORY OF SCIENCE

How is the Pasteur film viewed by scientific critics? p. 126.

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Is a sea pigeon a bird? p. 120.

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What food is considered good for arthritis? p. 121.

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Where is the newest laboratory of war? p. 120.

MINERALOGY

What metals are found in meteorites? p. 127.

PHYSICS

How powerful is the new University of Chicago magnet? p. 115.

PHYSIOLOGY

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Do scientists know what goes on in a steer's stomach? p. 121.

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Will noise add to life? p. 119.

SURGERY-PHYSICS

How can an operating room's air be made germ-free? p. 122.

PHYSICS

New Cosmic Ray Device Nears Completion at U. of Chicago

Giant 12-Ton Magnet in Wilson Cloud Chamber Serves To Bend Rays So Their Energies Can Be Calculated

MORE powerful than any other similar apparatus in the world is the new cosmic ray equipment now nearing completion in the laboratory of Prof. Arthur H. Compton, Nobel Prize scientist of the University of Chicago.

Heart of the device—a Wilson cloud chamber—whose strong field will bend cosmic rays and the atomic electrified debris so that their energies can be calculated. The magnetic field generated by the new Chicago magnet will be 40,000 times as powerful as that of the earth. The magnet was designed by Prof. Compton and his research associate, Haydn Jones.

The equipment will be used, states Prof. Compton, in a new series of experiments by which it is hoped further data can be obtained on high energy

particles to see if the known laws of electricity apply to them.

As cosmic rays pass through the moist gas of the Wilson cloud chamber in the field of the magnet, they will leave a fog trail which is automatically photographed. Prof. Compton estimates that there should be one cosmic ray entering each second and about one out of fifteen will be moving in the proper direction for photographing.

Curve Reveals Charge

The magnetic field will bend the paths of the cosmic rays. Very high energy particles are less susceptible to deflection than are those of lesser energy, in somewhat the way that a baseball is harder to curve than is a pingpong ball. Because the magnetic field will

curve the tracks of the paths of particles of high energy to a less extent than it will those of low energy, Professor Compton will be able to judge the energy, and determine if the particles are positively or negatively charged.

Previous experiments have measured energies up to 20 billion volts, but Professor Compton hopes to extend the measurement with his magnet to energies of 40 billion volts.

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AGRICULTURE

Agricultural Prospects Very Dark for 1936

IN COLD, neatly-typed figures, the Crop Reporting Board of the Bureau of Agricultural Economics announced on August 10 the black agricultural prospects of the nation for 1936. Even if rains now come, they will do little good.

Corn production estimates are only 46.8 per cent normal and the crop is the worst since 1881. Spring wheat is only 32.8 per cent normal and with the exception of 1934 is the worst on record. Oats are 55 per cent normal and of all the edible grains only rice at 86 per cent is anything like normal yield.

The potato crop at 59.8 per cent normal is the worst on record since 1863.

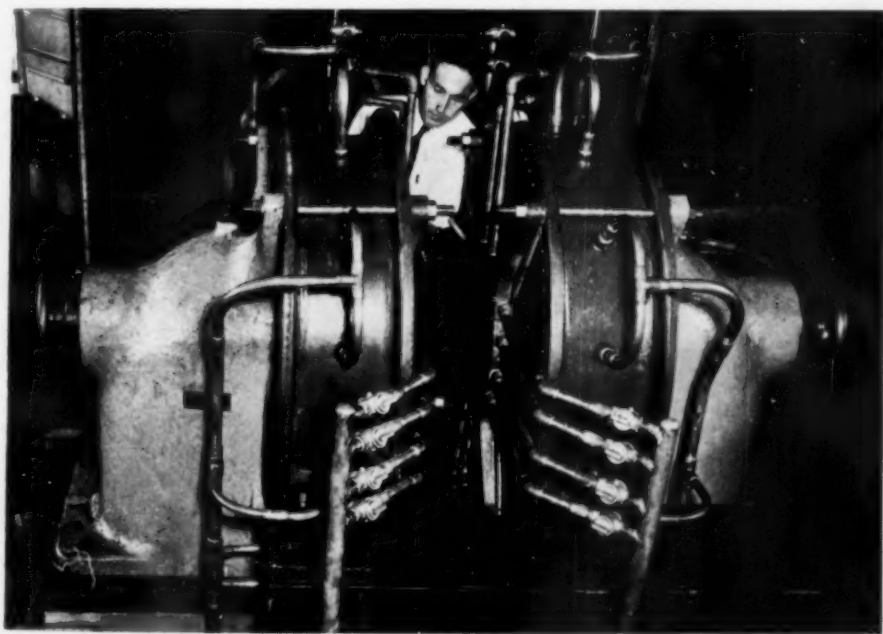
Cotton, unlike most other crops, has had favorable weather during July and the yields are expected to be above average in all states except Virginia and the Carolinas.

Affects Livestock

The reverberation of the report, covering the period up to August 1, in the livestock market will be widespread. Particularly affected will be hogs, which are most dependent of all animals on corn for fodder. Hay consuming animals will be better off than in the drought year of 1934. Hay supplies are 20 per cent greater than in 1934 and the number of animals is 3 per cent less. Heavy marketing of grain-consuming livestock and a lessening of winter rations for this stock are in prospect.

Crop conditions improved only locally during the week ending 8 a.m. Aug. 11, states the weekly weather and crop bulletin summary issued by the U. S. Weather Bureau (Aug. 11).

Showers of the week were confined mainly to the region east of the Mississippi River, while the great drought area of the central plains had abnormally high temperatures (110 de-



FOR COSMIC RAY STUDY

The giant 12-ton magnet with which Prof. Arthur H. Compton, Nobel Prize scientist of the University of Chicago, will launch new studies of cosmic rays. Haydn Jones, Dr. Compton's research associate, is shown examining the magnet which will be a part of Wilson cloud chamber equipment that will enable photographic determination of cosmic ray impacts to be taken. It is hoped that cosmic rays with energies as high as 40,000,000,000 volts can be studied by the device. The previous energy record was twenty billion volts.

grees and over) with only scattered local rains as compensation.

The drought, already called the most severe in the history of the nation, "has been intensified and where rains occurred they afforded only temporary relief, except locally," states the newest report.

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PSYCHOLOGY

"Blanks" Occur in Mind Several Times a Minute

YOUR mind "goes blank" several times every minute. During these blank periods you involuntarily stop work for a couple of seconds. If you are tired, the stops occur oftener—maybe eight or ten times each minute—and they may last twice as long.

This automatic putting on of brakes by the brain was discovered in experiments conducted at the psychology laboratory of the University of Chicago, under the direction of Prof. Arthur G. Bills. The "blocks," as Prof. Bills calls these blank periods, are not complete, he explains. The individual does not lose track of what is going on, but he must stop mental work on the task at hand.

Blocks partly account for the "er-r-r" and "ah," which public speakers put between words. These blanks are particularly conspicuous when a person is doing rapid calculating. Every so often, he is unable to proceed and stalls. Fatigue increases both the frequency and the duration of the blocks, causing bunching of responses or spurts of work.

Stutterers Block Often

Stutterers block about twice as often as normal persons and their blocks last longer, it was found.

"It is safe to assume that there is a common neurological basis between blocking and stuttering," Prof. Bills concluded.

Mental blocks are enforced resting periods, he explained. They may account for the fact that continuous mental work does not impair mental efficiency to nearly the same extent that muscular work impairs muscular efficiency, he believes.

By giving his subjects artificial rest periods timed to coincide with their blocks, Prof. Bills found that he could practically eliminate the blocks. He also found that most errors occur just before or just after a block; and that when the tasks are more tiring, the number of blocks is greater.

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ASTRONOMY

Tiny "Nearest" Planets Are Given Classical Names

THE TWO tiny planets, or asteroids, which approach closer to the earth than any other known body except the moon, have now been given names to honor two mythological characters who have so far been omitted from the sky. According to the Astronomisches Recheninstitut in Berlin, the one discovered in 1932 by Dr. Karl Reinmuth of the Neu-Babelsburg Observatory of the University of Berlin, has been named Apollo, after the ancient god of the sun, who also concerned himself with prophecy, song, and music.

This little body, probably about a mile in diameter, can come within as little as 3,000,000 miles of the earth.

The second asteroid was found in February of this year by Dr. E. Delporte

of the Belgian National Observatory near Brussels. On Feb. 5 it was only 1,376,000 miles away, within 75,000 miles of the closest that it can ever possibly approach. This has been named Adonis, after the beautiful youth who was beloved of Aphrodite.

It has tentatively been called Anteros in the United States, after the god who was opposed to Eros, the god of love. This name was appropriate, because formerly an asteroid called Eros had held the honor of making the closest approach—about 14,000,000 miles. Still another, called Amor, also a discovery of Dr. Delporte, in 1932, comes closer than it, reaching a minimum distance of 10,000,000 miles.

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PHYSIOLOGY

An Athlete's Knee Is His Most Vulnerable Spot

IN ACHILLES, it was the heel. In the modern athlete it is the knee.

On athletic fields more injuries occur to the knee than to any other part of the player's anatomy, Dr. Marcus H. Hobart, who for twelve years has been handling athletic injuries at Northwestern University, finds. He presents (*Journal, American Medical Association*, Aug. 15), a review of his experiences, with detailed statistics on the injuries that have occurred in that university in the last five years.

Football, as might be expected, has the longest casualty list of any sport. Dr. Hobart thinks this only natural for "probably five or six times as many students play football as any other sport."

Next to football in frequency of injuries comes wrestling, and after that basketball, baseball, track, swimming, water polo and boxing. Other sports are too safe to merit consideration.

The knee takes the brunt of the punishment for several reasons. Its position is exposed, it can be affected by both direct and indirect force, and since the ankles are well protected and do not

give way, the strain is transmitted to the knee. Dr. Hobart thinks it might be better not to strap players' ankles so tightly.

Next in frequency to knee injuries come those to the fingers and toes, ankles, shoulders, nose, face, elbows, back and legs, and feet.

Athletic injuries are either in a class by themselves or in a class with war injuries, the idea being to return athlete or soldier to team or trenches quickly and fully recovered. So that a student may be returned to practice or play only when it will do him no damage, Dr. Hobart states that a physician should be in full charge of the physical side of the team, as the head coach is in charge of the athletic side.

Fractured bones, in Dr. Hobart's athlete cases, are almost always put in a cast rather than a splint, as the cast cannot be easily removed. The general rule, he says, is to use a cast for fractures in children, athletes, idiots and doctors.

Sprains are the most common injuries in athletics, followed by contusions and concussions, fractures, cartilage injuries,

lacerations, dislocations and other hurts.

This team doctor never allows a player to go on the field with a bandage on his face. Bandages, he says, only excite opponent players of a certain

type to tear them off. He puts a colloid dressing on the wound, and this dressing is removed immediately after the game and a bandage applied.

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ENTOMOLOGY

Cannibalistic Enemies Among Corn Ear Worms

**Tight Husks and Resulting Crowding Encourage Them
In This Evil Practice With Benefit to the Farmer**

INSECTS that prey on other insects have long been recognized as man's allies: the agricultural expert turns loose swarms of such parasites and predators to prey upon pests and thereby save crops.

But there is one pest that is its own worst enemy—the corn ear worm. These repulsive larvae, that appear in ears of sweetcorn to the disgust of all proper housewives, are cannibals, and regularly eat each other up whenever there is an opportunity. Thus it comes to pass that the one ear worm you find in an ear of corn may be the living sarcophagus of a number of his departed mates, like that sad survivor of shipwreck in the "Bab Ballads," who in his sole person represented, among others

"... the Bosun tight,
And the Midshipmite,
And the crew of the Captain's gig."

Dr. George W. Barber, entomologist

in the U. S. Department of Agriculture, has made a study of the ways of this self-destructive pest, which he reports in a recent Department publication (Technical Bulletin No. 499, U.S.D.A.; Govt. Print. Off., 5 cents).

The corn ear worm, it appears, eats corn silk, green corn grains, or his brethren, all with quite equal appetite. If anything, he prefers his brethren; for wherever two or three corn ear worms are gathered together, presently there is only one. As a rule, the bigger and older ones are somewhat more cannibalistic than the younger and smaller individuals, but the young worms "go native" very readily if occasion (and a brother ear worm) offers.

Under normal conditions, the ear worms mature more rapidly on a mixed diet of corn and each other than they do if kept in crowded quarters with nothing but other ear worms to eat. Nevertheless, specimens kept in tin salve

boxes on a strictly cannibalistic regimen grew perfectly well and finally matured as normal corn ear worm moths.

The degree of cannibalism developed on actual ears of corn depended to a considerable extent, Dr. Barber found, on the tightness of the husks. The worms normally enter the ear by way of the tip. If the husks are loose, they keep more or less out of each other's way, with resulting greater damage to the corn through the feeding of several individuals. But if the husks are tight, the worms are crowded together, cannibalism develops quickly, and soon there is only one survivor to feed on the young kernels.

Corn breeders can take advantage of this fact, Dr. Barber suggests, by producing tight-husked varieties.

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METEOROLOGY

Early News Photographer Catches the Sun-Dogs

AN ALERT news photographer, at work in the early morning hours, obtained the interesting photograph of sun-dogs reproduced on this page.

Sun-dogs are observed much less frequently than their comparatively common occurrence would lead one to suppose, and a good photograph of

SUN-DOGS

This unusual photograph was taken from the top of the Detroit News building by William L. Seiter of the Detroit News' photographic staff. Two negatives were used.



them is unusual enough to be of considerable interest to meteorologists as well as to laymen. William L. Seiter of the *Detroit News*, in making this picture from the roof of the *Detroit News* building, used two negatives. Prints from the two negatives were spliced together and re-photographed to make the print as you see it.

Sun-dogs, like the more familiar "ring-around-the-moon," are caused by refraction of light through ice crystals in clouds high above the earth's surface. When the air in which the crystals are floating is windy or turbulent, the phenomenon may take the form of the ring. Only when it is quiet do the dogs make their appearance, because they are produced only when some of the angle edges of the ice crystals are predominantly perpendicular. They may appear at various distances from the sun; those in this picture are the most common ones, and are produced by the 60 degree angles in the crystals. The dogs are known technically as parhelia. They appear in beautiful rainbow colors, although the color may be so faint as to escape notice.

The light streak to be seen in the photograph connecting the dogs with the sun in the center is called the parhelic circle. It is caused by reflection, not refraction, of the light shining on the ice crystals and may extend entirely around the sky parallel to the horizon.

The tradition that the appearance of sun-dogs or moon-dogs is an omen of a storm has its basis in fact although it is by no means an infallible guide. The sun-dog, like the halo around the sun or moon, is most often formed by the ice crystals occurring in cirro-stratus clouds, and it so happens that such clouds often ride in the sky immediately before a storm.

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VITAL STATISTICS

Motor Deaths Drop In Early Part of 1936

MOTOR vehicle deaths were eight per cent less in major cities of the United States for the first 31 weeks of 1936 than they were for the comparable period in 1935.

Deaths so far reported to the Bureau of Census total 4,481, compared to 4,883 deaths in 1935.

Just half of the 86 cities in the report were able to show no deaths from automobile accidents for the week ending Aug. 1.

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FROM OGILBY'S "ACCURATE DESCRIPTION"

Quaint drawing of an early American scene. The double-spired mountain Popocatepetl is erupting and causing vast alarm to all except stout Cortes and a few of his men. Ogilby wrote that "the Smoke rises upright and with so much strength that by the greatest Wind it deviates not one jot from mounting upwards in a direct Line."

ANTHROPOLOGY

New Theory is Centuries Old, Early English Book Shows

IN A BIG and battered book written in England in 1671, you can find the most-up-to-date theory telling how the Indians or their ancestors came to American soil.

Muddling his way along, with Noah's Ark for an historic landmark of time, and with some fantastic notions about the world and its people, John Ogilby steered his course toward an amazingly sound verdict.

More remarkable than that, Ogilby considered the matter settled. He would be astonished to know that scientists almost 300 years later are still worrying over those questions: Who were the first inhabitants of the New World? When did they come? And how did they get to America in the first place? But he would be delighted to know that his views are being upheld by evidence dug out of the earth, and all the other resources of twentieth century science.

When John Ogilby set out to write

his 600-page volume on the latest and most accurate description of the New World, he devoted 40 or more pages at the outset to the original natives of the land. He said "About the Original of the Americans, the Learned Dispute so much, that they find nothing more difficult in Story than to clear that Point." Which sounds exactly like a modern scientific meeting when ancient America comes up.

Ogilby could then proceed to tell the curious notions that the Learned argued about, and joyfully poke holes in the weak spots of every debate. For example, he could jeer—with dignity, of course—at the claim that America was first peopled by seafaring Phoenicians or Carthaginians. Why, he exclaimed, even Hanno, who made the most remarkable voyage of ancient times, never got far off from the African coast. That Carthaginian idea, in Ogilby's opinion, was just a vain attempt "to give the

Honor of the Discovery of America to the Ancients." And present day science would nod assent to that.

Nor did the seventeenth-century Englishman think much of another popular theory: that the Lost Tribes of Israel became American Indians. Why, asked Ogilby, would they forget their laws, language, and ceremonies in America, when the rest of the Jews "observed nothing more strictly in all parts of the earth?"

After destroying a string of such theories, the writer arrives at one he can champion. America, he concludes, was inhabited long before the Israelites; in fact, soon after the Flood. And that, in seventeenth century thinking, was equal to saying that the first inhabitants

got to the New World early in human history.

Disposing of Europeans and Africans as possible "first Planters of America," he declares for the theory that the first Americans came from Asia. He calls them Tartars. Tartary faces America, and the two lands are probably separated only by northern straits. He thinks perhaps they may even join in the unknown Far North—as, in fact, they come near to doing at Bering Strait, where the gap of less than 50 miles is dotted with stepping-stone islands.

Ogilby, in short, decides that the first Americans came from Asia and came before the great civilizations of the Old World. And that is the verdict of science, 1936.

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PHYSIOLOGY

Longer Life Amidst Noise But Bad Effects Noted Also

Experiment in Pressroom of Tokyo Newspaper Indicates
Rats in Noise More Nervous, Grow Less, Have Few Young

IN THE midst of campaigns against noise, two Tokyo scientists have discovered that white rats kept in an excessively noisy environment have a longer life span than those sheltered from abnormal sound.

Dr. Yoshitomo Fujimaki and Dr. Kunitaro Arimoto, both of the Tokyo Hygienic Laboratory, would doubt whether silence, after all, is good for animal organisms, were it not for the fact that their experiments also revealed that white rats living in the midst of noise were more nervous, grew less, had less fertility and a greater infant death rate than those kept under normal conditions.

They began their experiments in 1930, conducting them exhaustively. In a spot under an elevated railroad over which 1,283 trains roar daily, they put 20 white rats to live. This group was more nervous and ate less (although more frequently) than the 20 rats living in normal surroundings. Their growth was 76.7 per cent for the male and 64.8 per cent for the female, taking the growth of the sheltered rats as 100 per cent; and their increase was 25 per cent, while that of the other group was 80 per cent. Also their young had a much higher death rate. But, strange to say, the rats under the railway lived 53 days longer in the aggregate than

those sheltered from sound. Dr. Fujimaki calculates that a day in the life of a white rat is the equivalent of a month in the life of a human being.

These scientists repeated their experiment twice after that, and the results were practically the same. The second time they placed one group of the white rats in the pressroom of the *Nichi Nichi*, a Tokyo daily newspaper. The third time, they kept one group in a room in which a bell buzzed continuously, while the other group was housed in a sound-proof room. Each time, the group living in the midst of loud noise had a longer span of life than the sheltered group, although they were more nervous, grew less, had fewer young, and suffered a greater infant mortality.

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PHYSIOLOGY

"Dogs Got Rhythm" and Thyroid Feeding Peps It Up

"DOGS got rhythm"—and they have even more after they have been fed thyroid glands. Such is the indication of a discovery by Drs. N. Kleitman and S. Titelbaum, two University of Chicago physiologists.

The scientists first taught their dogs to show they had a sense of rhythm by

lifting the same foot every time they heard a metronome beating one hundred times a minute. Each time the metronome was operated at this speed the dogs, placed in a small wooden enclosure for the duration of the lesson, received a small electric shock in one hind leg, until finally they learned to avoid the shock by raising the leg as soon as the metronome signal was heard. Since their legs were not shocked when the metronome was run at other than the one hundred a minute beat, the dogs learned to respond only to this.

Test Rhythm Sense

When their training was complete the dogs underwent a three-day final examination. The metronome was run at the correct rate several times during each day, to be sure that the dogs would respond properly. Five experimenters, each working independently with his own dog, carried on the work.

Now the dogs were tested with the metronome running at various speeds, the one to which they had been trained to respond, and others as close to this as they could distinguish. Careful records of just how accurate was each dog's sense of rhythm were kept.

Then the dogs were fed thyroid gland material. They showed they had a better sense of rhythm on this medication by not responding as often as before to beats close to the one hundred a minute one to which they had been trained. Furthermore, they moved their legs more energetically in response to the correct beat while on thyroid.

Superior Animals

Two of the animals had a superior rhythm sense, and made especially good grades in their tests even when not given any thyroid. These showed no improvement on administration of thyroid. Normal animals grew fatigued toward the end of each experimental period of 5-10 days and got poorer grades at the close of each one. But the thyroid dogs appeared only to hit their strides as each trial progressed, and made better showings towards its end than at the beginning.

The object of the study was not to find out about dogs' rhythm but to learn whether or not thyroid affects conditioned reflexes, such as that set up in the dogs, and differentiating ability, such as enabled the dogs to distinguish between the different rhythms.

The study just reported is part of a study of sleep. The scientists hope to learn what part conditioned reflexes and differentiation may play in sleep.

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CONSERVATION

Drought May Aid Reforestation Program

THE severe drought in the interior of the United States offers an opportunity to gain highly valuable information which has great practical importance on the future reforestation program of the Federal government, states E. N. Munns, chief of the Division of Silvics, U. S. Forest Service.

The Forest Service needs information on the drought resistance of trees and shrubs, declares Mr. Munns (*Science*, Aug. 7). Such information is now sadly lacking.

Interested persons in the drought area are asked to send to the Division of Silvics for data sheets on which they may list pertinent information that will eventually aid reforestation, erosion and flood control and other cultural operations in the forest.

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MARINE BIOLOGY

Lack of Fresh Sea Water Causes Loss of Sea Pigeon

NEW YORK City's Aquarium and all other marine exhibition halls throughout the nation would be highly pleased if someone would invent a satisfactory closed system for circulating stored ocean water and have it keep its natural composition.

For lack of such a system the metropolitan showplace has just lost one of its most interesting and rare specimens of recent years—the sea pigeon.

What was a bird doing in an aquarium? The sea pigeon was no bird but a slug-like marine invertebrate. It took—and in its native tropical waters around Bermuda still takes—its name from its wing-like appendages which propel it through the water. At New York's Aquarium it looked like nothing so much as a rather formless bird flying slowly and gracefully through the water.

C. W. Coates of the New York Zoological Society's department of Tropical Fishes at the Aquarium, states that the last of three specimens has finally died. And all because the proper circulation system for the sea pigeon's tank was not available.

The sea pigeons, on arrival, all seemed to be of different species. They never were accurately identified. Yet, despite the want of a formal name, the hardy one made a good exhibit. For one thing, when annoyed the sea pigeon will release a quantity of dark ink-like

fluid, providing a screen behind which it can make its escape in its natural habitat.

This fluid, reports Mr. Coates in the *Bulletin* of the New York Zoological Society, may be collected and used in a fountain pen. It makes a permanent record on paper.

The New York sea pigeon raised the hopes of the marine scientists for a time by depositing long strings of bright yellow eggs about its tank for a month after arrival. None of the eggs, however, proved to be fertile.

The difficulty encountered in raising the sea pigeon is similar to one which any aquarium faces when it places the ever-popular octopus on exhibition. Record length of life for these many-armed invertebrates at the New York Aquarium is fifty-two days.

Aquaria which have the facilities for pumping good clean ocean water through their tanks report lengths of life for octopi of several years, but New York's harbor is hardly up to the sanitary standards for this purpose.

Science News Letter, August 22, 1936

ASTRONOMY

Largest Star Camera Will Photograph Milky Way

ATWO-and-a-half ton battery of three star cameras, the largest using plates two feet wide, has just been placed in operation at the private observatory of Dr. Gustavus Wynne Cook, Wynnewood, Pa. It is the largest camera battery of its kind in the world. Dr. Cook will use it to make a series of photographs of the entire Milky Way. After photographing all the Milky Way area that is within reach from the Northern Hemisphere, he expects to move the equipment to South America or South Africa, so that regions of the sky which never rise in the Philadelphia area can be recorded.

The three cameras take pictures on plates 20 by 24 inches, 14 by 17 inches and 8 by 10 inches. They are equipped with lenses 6½, 5 and 4 inches in diameter, of a type invented by Dr. Frank E. Ross, of the University of Chicago's Yerkes Observatory. There is a guiding telescope with 4-inch lens by means of which the photographer can keep the cameras accurately pointed at a selected part of the sky. He can also correct any errors in the running of the electric motor which turns it once daily from east to west to compensate for the earth's rotation. The instrument was built by J. W. Fecker, of Pittsburgh.

Science News Letter, August 22, 1936

IN SCIENCE

PHOTOGRAPHY-ORNITHOLOGY

Camera Stops the Wings Of Humming-Bird in Flight

See Front Cover

A REMARKABLE stop-motion photograph of three female ruby-throated humming-birds hovering about a vial of sweetened liquid is shown on the cover of this week's SCIENCE NEWS LETTER.

Prof. Harold E. Edgerton, Kenneth J. Germeshausen and Herbert E. Grier of the Massachusetts Institute of Technology, where this ultra-high speed method of photography was developed, found that in hovering the wings move at the amazing speed of nearly 60 beats a second.

The photograph, taken at an exposure of one one-hundred-thousandth (1/100,000) of a second, is believed to be the first of its kind showing the wing action of a humming-bird. It was made at the home of Mrs. Laurence J. Webster at Holderness, N. H., where Mrs. Webster, founder of the New Hampshire Nature Camp, has devoted many years to the study of wild bird life. The birds are so tame they take food from her lips, perching on her head and shoulder while awaiting their turn to feed.

Science News Letter, August 22, 1936

MILITARY SCIENCE

Michigan University Has New War Laboratory

THE newest precision measuring laboratory of the U. S. War Department has just been established at the University of Michigan. Ordnance reserve officers are now being instructed in the laboratory, reviewing the manufacture of artillery munitions.

During the school year the War Laboratory equipment on precision measure devices will be available for regular engineering instruction, but at all times the laboratory will be held in readiness for military war-time use.

Only one other university, Stanford, has a War Department laboratory of this type. The other six in existence are located in government arsenals.

Science News Letter, August 22, 1936

THE FIELDS

PHYSIOLOGY

Interior of Steer's Stomach Photographed

MOTION pictures of the interior of a steer's stomach as the animal digests its food were shown to the American Veterinary Medical Association meeting.

For 18 months scientists of the Ohio Agricultural Experiment Station and Ohio State University have been "shooting" the stomach interiors of five steers through special openings in their sides. Plugs kept the openings closed normally and the animals lived normal lives, finally being sold on the market in good condition.

Food and water, in the movie film, are seen to enter the stomach. Gradually the food is broken down to the proper consistency for passage on through the digestive system.

At times, when the animal is not feeding, saliva is seen to enter the stomach in periodic spurts.

Dr. Arthur F. Schalk and Prof. Francis W. Davis performed the experiments and took the motion pictures in the studies, which are being continued.

Science News Letter, August 22, 1936

AGRICULTURAL CHEMISTRY

New Fertilizer Developed For Phosphorus Use

COMBINING a possible large-scale use for farm products with a very much more effective way to get phosphorus to the roots of growing plants, a new type of fertilizer developed at the Nevada University College of Agriculture in Reno is being watched with greatest interest by both agricultural scientists and fertilizer manufacturers.

Phosphorus is one of the most important of all fertilizer elements, yet it is at present one of the most inefficiently used. In the forms now commercially available, the phosphorus is grabbed by other chemical elements in the soil and held in insoluble form almost where it falls. It does not penetrate to any appreciable degree below the level disturbed by the plow, whereas most common crops and all orchard trees send their

feeding roots far below the plowline.

Obviously, a soluble fertilizer, that will penetrate deeper, is a highly desirable thing. Drs. Robert Stewart and V. E. Spencer have been experimenting with organic compounds of phosphorus, instead of the simpler inorganic ones now in use. They have made several entirely new phosphate compounds, of which the most successful, both in its behavior in the soil and in its possibilities for economic manufacture, are compounds with common glucose.

If the glucose phosphates come into extensive use, it will provide a tremendous potential market for corn and other high-starch farm products, of which there has been an embarrassing surplus at times since the war. Starch is easily converted into glucose, and the glucose, combined into the new, highly efficient phosphorus fertilizer, can return to make the farm and orchard more profitable.

Science News Letter, August 22, 1936

ANTHROPOLOGY

"Horned Men" of the Plains Linked with Iroquois Indians

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The Pawnees were called horned men because of their curious custom of shaving the head clean except for a small tuft of hair on top which was daubed with bison fat and red ochre until it was stiff enough to stand erect or curve slightly backward like a horn.

The remains of these people now being turned up indicate strongly, Mr. Wedel says, that the Pawnees were not originally a Plains people but moved westward out of the southeastern woodlands like the pioneering whites who came much later in the covered-wagon days.

A remarkable resemblance was found between Pawnee pottery and the typical earthenware utensils of the Iroquois. Other links are seen in a highly characteristic style of stone pipe and small triangular, notched arrow points. It is thought that these clues indicate that both Pawnees and Iroquois might have been derived originally from some common eastern woodlands stock.

Science News Letter, August 22, 1936

MEDICINE

Egg Diet Is Found To Be Helpful in Arthritis

"EAT eggs" is the message of five doctors of the Medical College of Virginia to people who suffer from arthritis. Drs. J. C. Forbes, R. C. Neale, O. L. Hite, D. B. Armistead and S. L. Rucker have found that diets which contain a great deal of sulphur and little carbohydrate are beneficial to sufferers from the painful disease.

Arthritis, these doctors find, is accompanied by the presence of indole in the blood. This is a chemical produced by the decomposition of body products. It has long been known to be deleterious. To remove this indole the body needs sulphur. The Virginia doctors therefore feed their arthritis patients on diets which have much sulphur, such as is found in meat and eggs. To aid in preventing indole production in the body only very little carbohydrate is fed. Such foods as potatoes and rice are entirely eliminated from the diet.

The results of this diet, the doctors find, are promising. In one case the patient was kept on an ordinary diet for a month. There was a good deal of indole in his blood, and he suffered considerably. After a month on the special diet there were only traces of indole in his blood, and he felt stronger, suffered less. At the end of another month there was no indole in the blood, and the patient was considerably improved.

In another case, after having been on the diet for some months, the patient temporarily stopped following it. He had completely lost his pains, but they came back almost immediately. Once again on the diet, the pains left him.

Science News Letter, August 22, 1936

AGRICULTURE

Drought, Grasshoppers Make "Pineapple Corn"

"PINEAPPLE" in gangster literature used to have a sinister significance, as an instrument of destruction.

Now the word has a new and equally sinister significance, but as the end-result of a different kind of destruction.

In the drought-afflicted parts of the Corn Belt the stalks grew short, with abnormally short joints. Grasshoppers attacked, chewing off the leaves, leaving only the tough bases of the mid-ribs sticking out around the stalks, in bristling array.

These stripped stalks have been given the grim nickname of "pineapple corn."

Science News Letter, August 22, 1936

SURGERY-PHYSICS

Germ-Proofing Your Operation

Barrage of Germ-Killing Rays Used To Destroy Any Bacteria That Might Lurk in Air of Operating Room

By JANE STAFFORD

NEXT TIME you have a surgical operation, it may be performed under a barrage of germ-killing rays that destroy the last possible chance of any infection setting in to threaten your life or even to delay your recovery.

The chances of such infection are mighty slim, anyway, with modern surgical technic: Everything which touches the wound and field of operation—instruments, sponges, surgeon's fingers—come germ-free, fresh from the sterilizers; in addition, the surgeon and all his assistants are gloved, robed and masked so that not even harmless organisms which may be present in nose and mouth and on the skin can get to the surgical wound.

Even with all these precautions, infections do occasionally occur after operations and Dr. Deryl Hart, surgeon-in-chief at Duke Hospital, Durham, N. C., believes these can be avoided and opera-

tions can be made safer by disinfecting the air above the operating table. His results since installation of the germ-killing ray machine at Duke Hospital seem to show that he is correct.

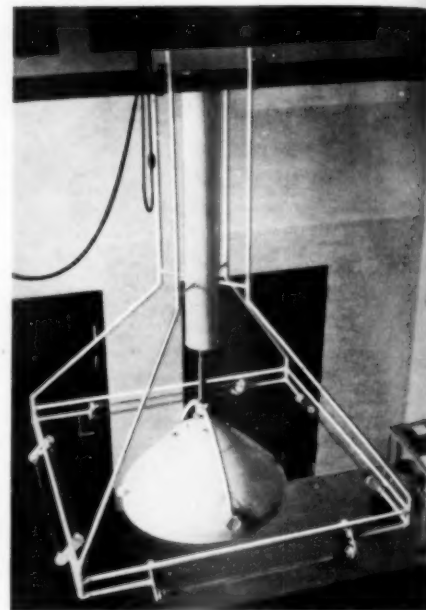
Ordinary air, as you know, contains countless numbers of bacteria or micro-organisms—tiny one-celled creatures that cannot be seen without a microscope. The number and kinds of these organisms vary in different places. Some of them are comparatively harmless organisms, but the ones which can cause disease, familiarly known as "germs," are also present in the air to greater or less extent. Particularly common are the group known as staphylococci, commonly found in boils, abscesses and carbuncles. Generally speaking, these organisms do not harm a healthy person. All of us come in contact with thousands of them every day. Some varieties of staphylococci, however, can cause serious illness, and even the milder ones may be too much for a patient, weakened by the strain of a surgical operation, to stand.

The air contains more of these germs—staphylococci and other varieties—when many people are together in a closed place such as a theater or church, breathing germs ever present in throats and noses into the atmosphere. That is why public health authorities advise avoiding crowds when an epidemic is loose in the community.

In Operating Room

Operating rooms, although they do not compare with a theater for crowds, do have a number of people in them in the course of a day. Dr. Hart points out that in large hospitals the operating rooms are in use the greater part of the day and a part of the night. With the modern trend for extensive surgical procedures, a larger operating personnel—internes, nurses, anesthetist and orderlies—is necessary. A number of visiting doctors may be present and also a class of medical students. When the room is occupied, there is considerable contamination of the air with disease-producing organisms, Dr. Hart says.

This problem of contamination of surgical wounds from germs in the air was first attacked by the great Lord



HEALTHFUL BARRAGE

Specially designed tubes clustered around the lighting fixture in the operating room at Duke Hospital deliver a barrage of germ-killing ultraviolet rays into the air directly above the patient undergoing surgical operation. The operating table is not shown, but would stand beneath this light. (Picture from Modern Hospital.)



TO KILL GERMS

The germ-killing rays come from a tube developed by Dr. Robert F. James, research physician of the Westinghouse Lamp Company. The tube may be made in many different shapes, the one used by Dr. Hart being similar to the long slender one at the back of the table.

Lister, the Father of Antiseptic Surgery which has become the aseptic surgery of today. When Lister started his career as surgeon in Scotland, in the middle of the nineteenth century, infected wounds were the rule rather than the exception. Pus was considered "laudable," the necessary first step in the healing of wounds. Erysipelas, septicemia (blood poisoning), hospital gangrene, and tetanus or lockjaw were rife in all the hospitals, and the maternity wards of hospitals were full of puerperal sepsis, the dreaded childbed fever.

The fatality for operations was terrific. According to one authority, half the patients operated on in hospitals died, even though the surgeons limited themselves to attempting to repair wounds, lancing boils, removing limbs and one or two minor operations. There was serious talk of burning all the hospitals, as this seemed the only way to get rid of the horrible gangrene, which caused such a stench in the wards that the windows had to be left open all the time.

This was the period when Pasteur was at the beginning of his epoch-making discovery of the part played by bacteria in causing disease. Reading reports of Pasteur's early experiments on fermentation of wine gave Lister the idea for his first attack on hospital gangrene. Air came in contact with wounds, and if something in the air could cause fermentation of the grape juice, as Pasteur reported, perhaps it could also cause the putrefaction of human flesh which surgeons saw all around them.

Simple Fractures Heal

The idea was strengthened by the fact that simple fractures, in which the bone was broken but there was no flesh wound—and no contact of the bone with air—healed rapidly. The bone could be set and splinted and in time grew together again and the patient was as well as ever. If the broken ends of bone cut through the flesh, however, it was quite another story. In about half of these cases, inflammation set in, followed by pus, fever and death.

Lister determined to try to kill whatever it was in the air which caused inflammation and pus in wounds. When the next compound fracture case was brought to the operating room, he carefully painted the ends of the broken bone and the flesh surrounding it with carbolic acid. That was before the germ-killing properties of carbolic acid were known, but Lister had heard that carbolic acid was being successfully used in Carlisle to destroy the odor from the town's sewage system.

Tragic Disappointment

The first case was a tragic disappointment—the patient died in spite of the new treatment. Undaunted, Lister tried again, the second time with success. After a few such successes, Lister had carbolic acid sprayed into the air from what was called a "donkey engine" while he was operating. Dr. Hart's ray machine may be considered a scientific descendant of Lister's carbolic acid spray. The air above the operating table at Duke Hospital is, in manner of speaking, sprayed with rays that kill bacteria—harmful and otherwise.

The rays that do this job are ultraviolet rays, but not the ones that change ergosterol into rickets-preventing vitamin D. Unless you are a physicist, you probably never realized that there is a fairly large family of ultraviolet rays of varying wavelengths. The longest ones, the big brothers of the family, are particularly good for producing fluorescent

effects and make possible the taking of photographs in the dark. Next come the group that can be used to cure or prevent rickets, and these are also the ones that give you your sun-tan.

The Germ-Killers

The babies of the family, rays from 2700 Angstrom units down, have the germ-killing effect but without sunburn blistering. These are the rays that sterilize the air for Dr. Hart's operations. The tube which delivers just these rays into the air was designed and constructed by the Westinghouse Lamp Company.

Eight such tubes, two on each side, are ranged about the lighting apparatus that hangs directly above the operating table. The effectiveness of the rays was first tested in the laboratory. A filtered suspension of staphylococci, the commonly found germs, was sprayed on a plate of culture medium and exposed to the rays at a distance of five feet. After sixty seconds, all the germs were dead. Plates sprayed with unfiltered suspensions, containing more of the germs, were exposed at the same distance and within five minutes all the germs had been destroyed.

Wounds in animals were next exposed to the rays for periods varying from half an hour to ninety minutes.

No damage was apparent; in fact, healing seemed to be more rapid than in the control animals not exposed to the rays. This same favorable effect of producing more rapid healing of wounds was noted when Dr. Hart started operating on patients under the rays.

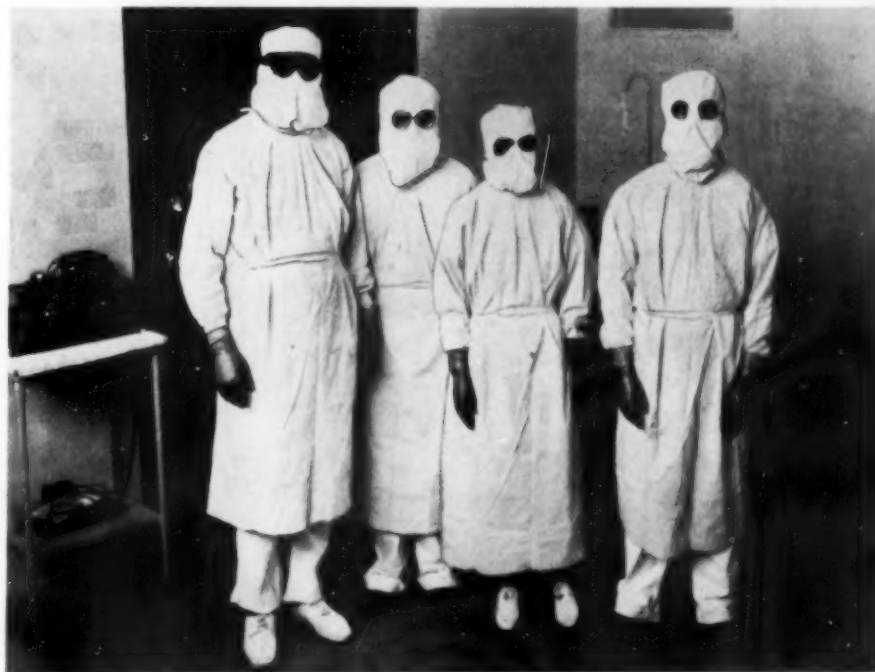
Plates of germ culture medium were exposed to the air during actual operations. When the tubes were not in use a goodly number of bacteria settled on the plates, showing that there were plenty in the air of the room. When the tubes were sending their barrage of germ-killing rays into the air, the plates showed that practically all the bacteria in the air about the operative wound, the supply and instrument tables were killed, although in the corners of the room, thirteen feet from the cluster of tubes, about 10 or 20 per cent of the bacteria escaped destruction.

Infections Disappear

"Operating room infections, which were fairly common before these tubes were installed, practically disappeared," he reported to Modern Hospital.

After the operation there was less rise in temperature, patients had less pain, their general condition improved rapidly, and their stay in the hospital was shortened.

While operating under the rays, Dr.



NOT KKK

Hoods of starched cloth and plain glass goggles are worn by Dr. Hart and assistants to protect themselves from the rays, which have some sunburning effect during long exposure. The rest of the regalia is part of the customary outfit worn by surgical "teams" as one of many measures to prevent germs getting into the patient's wound. (Picture from Modern Hospital.)

Hart and his assistants wear a get-up that looks not unlike the traditional costume of the Ku Klux Klan. This is because the rays do have some sun-burning effect. Working within six to eighteen inches from the tubes for long periods of time, it is necessary to have some protection. This is afforded by a hood or helmet of starched cloth that covers head and neck completely and tucks under the operating gown. Their eyes are protected by goggles of plain glass which is impermeable to the radiation. All this is pretty warm and uncomfortable. Suction tubes placed beneath the goggles keep them clean, but a more comfortable and adequate form of protection is being developed.

The patient, of course, is not exposed to the rays for as long as the operating "team," members of which may work under the radiation all day, if there is a heavy schedule of operations. In addition, the patient is pretty well protected by the sheets which drape every part of him except the actual field of operation. This draping of the patient is an impressive part of the ritual of modern operations—a ritual developed and designed to prevent infection.

Boiled Towels

This, too, goes back to Lister and the days of the carbolic acid spray.

When Lister was trying to keep the germs of the air from getting into his patient's wound, he did not, at first, realize that he was introducing germs with his hands, instruments, sponges, and even the dressings applied at the end of the operation. He seems to have had a hunch about it, however. According to one account, at the second operation in which he used carbolic acid—the first from which the patient recovered—he demanded for the dressing of the wound the "cleanest towel in the house" and told the Sister who helped him to *boil* it.

That boiling, which killed any germs on the towel, was a revolutionary step. It may have helped as much as the carbolic acid to keep the wound from infecting. Certainly it was the first step toward the aseptic surgical technic practiced today in every operating room in the world.

In the old days, hospital dressings were obtained from housewives who sent in their old linen. This was torn up and used without even washing before putting it on wounds. The sponges used inside the wound were ordinary sea sponges, used in one operation after another, with only an occasional washing with soap and water.

The surgeon washed his hands after operating, never before. He wore his oldest coat, which gradually became coated with blood and pus. It was never cleaned, simply hung in the closet between operations. Needles and the wire or silk for sewing up the wounds were not sterilized. The very knives might have last been used in the dissecting room on a corpse and been plunged into the patient without even being washed in between.

Clean Hands

Lister changed all that. He and all his assistants washed their hands before an operation. They wore clean aprons. Instruments were washed and soaked in carbolic acid or boiled. Sponges were soaked in acid. A way to sterilize the silk for stitches was found.

Most surgeons thought he was crazy, laughed at his methods. As his success continued, and as the science of bacteriology grew and showed the soundness of his ideas, other surgeons began to adopt his methods, which were gradually improved and elaborated into the modern aseptic technic for operations.

This proceeds according to rigid rules. Before entering the operating room, the surgeon and all who assist him remove all outer garments and don clean, enveloping white gowns that have been sterilized. Head and hair are covered by caps or helmets, also sterilized, as are the masks that cover noses and mouths.

"Scrubbing"

The scrubbing of the hands is a ceremony in itself. Surgeon, internes and other doctors who assist him with the actual operation and the "clean" nurse who handles the sterilized instruments and threads needles all "scrub" for every operation. This means scrubbing the hands and arms up to the elbows with green soap and sterile brush for three minutes; cleaning the nails thoroughly with a sterile orange stick; and again scrubbing up to the elbows, with a second sterile brush and more green soap, for five minutes. The three- and five-minute periods are actually timed by a clock placed conveniently near the washbasin for the purpose. The faucets of this basin, incidentally, are operated by foot levers. The scrubbed hands must touch nothing that is not germ-free. After the scrubbing they are thrust into thin rubber gloves, plucked from the sterilizer and held out to the doctors and "clean" nurse by the "dirty" nurse, who never touches the gloves herself,

handling them with forceps that stand with the business end in a solution of carbolic acid.

"Dirty"

The "dirty" nurse, of course, is not dirty in the usual sense, but she does not wear the gown, cap and mask and does not "scrub." Her job is to get extra supplies or instruments which may be needed.

There is a touch of romance behind the gloves. They were introduced into the ritual by that great American surgeon, Dr. William Stewart Halsted, first professor of surgery at the Johns Hopkins Medical School. The custom at that time was to operate with bare hands, immersing them after the scrubbing in a solution of carbolic acid. This strong acid was irritating to some skins, notably to the skin of Dr. Halsted's head operating room nurse, the lady who afterwards became Mrs. Halsted. The chief surgeon was much concerned over her hands. Because the carbolic acid was so irritating to them, the rubber gloves were introduced to take the place of the carbolic in cutting down danger of wound infection from the hands.

Draping

After he has scrubbed, the surgeon drapes the patient so that every part of his body is covered except the field of operation, which is shaved if necessary and scrubbed up with iodine and alcohol to kill any germs on the patient's skin. The draping is done first with towels and then with sheets, all of them sterilized and specially folded so that they can be draped with a minimum of handling. The "clean" nurse lifts them by the corners, held high above her head, so that the sheets fall open without touching anything. Then she turns and passes the corners to the surgeon.

As surgeons developed all these and many other precautions for keeping germs out of surgical wounds, they grew to ignore the danger of contamination from the air, Dr. Hart charges. Lister's carbolic acid spray was abandoned by its inventor, and no one since then has paid much attention to air-borne germs in operating rooms except to have the surgical "team" wear nose and mouth masks. Dr. Hart does not believe these are enough to keep dangerous germs out of the air. Surgeons elsewhere who have had few or no cases of operating room infections may, however, consider it unnecessary to install the ray tubes.

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Science News Letter, August 22, 1936



ARCHAEOLOGY

Humor in Indians' Carving Is "Delightful Surprise"

A MASTERPIECE of ancient American art portrayed with a sense of humor!

This discovery from ruins of a Mayan Indian city in Guatemala is intriguing archaeologists, who call it a "delightful surprise."

It appears that America's most highly civilized Indians, the Mayas, were not afraid to satirize themselves and their leaders as they looked in public meetings. Sculptors and painters usually pretend that important occasions go off smoothly, with everybody on his dignity. This Indian sculptor knew otherwise, and dared to play lightly with such a scene, even though his stone art was to adorn the doorway of a lovely and dignified temple.

As a result, modern America can see for itself what it might have suspected, that American audiences over a thousand years ago included the whisperers, the man who pokes the fellow in front, the speaker who mumbles and turns his head. They are all there, portrayed by an unknown sculptor in a scene that some critics have pronounced the finest known specimen of Mayan art in stone.

When the stone lintel was discovered at the ruins of Piedras Negras by an expedition of the University Museum of

the University of Pennsylvania, the carving was badly worn and damaged, but its beauty and importance were evident. Six dates on the lintel in Mayan hieroglyphics were read by Dr. J. Alden Mason of the expedition, and none was later than Dec. 2, 757 A.D.

Now, an attempt to reconstruct the sculpture has been made, by extending in a drawing the broken-off lines of human figures to show what the Indian group was doing in the picture. Marred as it is, the scene retains many cues to poses and costumes that an expert eye can visualize in their original complete state.

Miss M. Louise Baker, an artist with long experience in archaeological art, was asked to work out the problem.

Presenting her drawing, now finished, in the museum's bulletin, Miss Baker vividly points out amusing touches in the Indian's work.

"Two of the trio," she writes, referring first to the left hand group, "forgetful of the occasion, are entirely absorbed in their own argument, while the third, indignantly bracing himself upon outspread feet, gives a vicious bump with his hip (breaking his own obsequious pose for the moment), demanding attention.

MAYAN HUMOR

Although intended for use over the door of a temple, this stone carving pokes fun at public audiences, not so different then from those listening to political speeches this fall. Standing at the left are the inevitable whisperers engrossed in their own argument and the man who reproves them with a nudge of the hip for attention. Seated at the left is the man who pokes his neighbor with a request for information. The neighbor cranes his neck to see over the feather headgear ahead. The deaf man who pulls his ear out to hear better is seated at the right. Notice the toying with beads and tassel.

"The seated figures are very human in manner and detail. The left dignitary gently pokes the friend in front to ask what it is all about. The friend, willing to accommodate, vainly tries to peer over the intervening mass of feathers, bracing himself on his foot, in his effort to see—a taut neckline giving the cue.

"The next man complacently toys with his tassel, his sleek round body oozing contentment. The fourth in line is a lean, capable young man, to whom the chief is evidently directing his words and attention. The fifth, the patriarch of the row, has slumped in the shadow of his master, his fan arrested in mid-air. The sixth, holding his vase upon his knee, absent-mindedly fingers his beads.

"The last man, and the only one whose face was not completely destroyed, has lost interest after a fruitless attempt to hear and his hand has probably dropped from cupping his ear to toying with his ear-plug. (Turn page.)

"The group on the right was the most difficult. An attachment for a foot was finally discovered, proving that four figures instead of three were filling the niche. The comparative height of knees gave evidence that two boys, a youth, and a grown attendant comprised the party. Anatomically, it is impossible to group them otherwise."

The lintel is of buff-colored limestone, 24 by 49 inches. The poses of the figures, which have been called by Dr. Mason "Greek in quality," are praised by Miss Baker. The clothing, and the objects held by the Indians, are so exquisitely shown in details that they add to modern knowledge of the ancient Mayan civilization. Even the fingernails on the hand of the chief are perfectly shown in the original, which Miss Baker declares "must be seen to be appreciated."

Science News Letter, August 22, 1936

The artillery plant is so called because of its trick of shooting its seed.

METEOROLOGY

Flights to Study Adverse Polar Weather Conditions

SYSTEMATICALLY and with painstaking care, Soviet scientists and engineers are tapping the secrets of the frozen Arctic to learn what pitfalls await plans to establish aerial transportation through its far-flung Siberian terrain, its Pacific borders and eventually to reach North America.

The 10,000 mile flight from San Francisco to Moscow via the polar route which was recently started from the United States by the two Soviet airmen, S. Levanevsky and Victor Levchenko, is no mere stunt flight as were some of the trans-Atlantic crossings in the post-Lindbergh era.

With instructions from the Moscow home office, the Soviet pilots frankly

are seeking the "worst" weather the Arctic can offer. If they arrive home safely, the U.S.S.R. will have highly valuable first hand data on the possibilities of Arctic flight.

What few people outside of professional navigators seldom realize is that the shortest route between Moscow and Chicago, for example, is across Polar regions. The Moscow-San Francisco trip would be shortest by going directly over the North Pole.

Although it has yet received little mention, other Soviet aviators unofficially broke, late last month, the world's long-distance airplane record with a non-stop flight of 5,825 miles. Remaining aloft nearly 56 and one-half hours, pilots V. P. Chkalov, G. F. Baydukov and navigator A. V. Belyakov took their heavily-laden, single-motored ANT-25 plane under adverse weather conditions from Moscow to the tiny island of Udd on the Siberia Coast just west of Nikolayevsk-on-Amur.

Deliberately they flew out over the Barentz Sea and the Arctic Ocean for more than half of the flight.

While the distance covered exceeds the record of 5,657 miles made by the French aviators M. Rossi and P. Codos in 1933, it cannot be entered as official because it was not in a straight line. Take-off and landing points alone are considered in the records. But, after all, the Soviet pilots were seeking knowledge of Arctic conditions, which is more important than records.

Science News Letter, August 22, 1936

A new variety of wheat known as Number 19 has been developed at Cornell University's experiment station, and is pronounced high in yield and very satisfactory in baking tests.

A Free Copy to Your Friends

TEN YEARS ago, Science News Letter started as a mimeographed bulletin sent weekly to a small group.

It pleased most of its readers from the start, and they told others. Demand for it soon outran the capacity of a mimeograph and the Letter was put on the presses. Illustrations were added. Its services were expanded. By 1929 it had 7,000 subscribers. The depression years saw it double in circulation until now it is received weekly by more than 19,000 men and women all over the world.

Remembering this, we feel that you may have friends who would like to know about Science News Letter. Send us their names and addresses and we will gladly send to each a free copy.

SCIENCE NEWS LETTER

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● RADIO

August 23, 2:15 p.m., E.S.T.

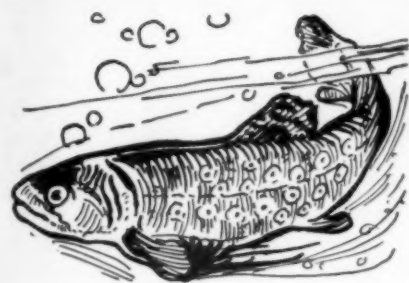
CHILDREN WITH NERVES—Dr. Knight Dunlap of the University of California.

September 1, 2:15 p.m., E.S.T.

SCIENCE IN HARVARD'S TERCEN-TENARY—Watson Davis, Director of Science Service.

In the Science Service series of radio programs over the Columbia Broadcasting System.

NATURE
**NATURE
RAMBLINGS**
by Frank Thone



Fish Oddities

ODD, HOW we have come to associate the idea of oddity with fish!

You will often hear the phrase "Odds Fish!" from some one using what he fancies to be archaic English. And from that the epithet "odd fish," as applied to slightly eccentric humans, seems to have been derived.

Actually, the phrase has nothing to do with oddity. It is a modern corruption of the sixteenth-century cant or petty-profanity "'Ods Fish," meaning "God's fish." At about that time, it was considered particularly bad to make direct use of the name of God in ordinary or profane conversation, so the clipped and elided forms 'Od and Gad came into use, in such phrases as Ods Fish, Ods Blood, Ods Bodikins, and Gadzooks—the latter being a compaction of Gad's hooks, and "hooks" in turn being slang for "hands."

But why ascribe to the Deity a particularly proprietary interest in fish? The answer is somewhat obscure, but it may be that our early-modern forebears in England were referring to a practice a thousand years older than themselves, the use of the fish in early Christian symbolism.

One of the many honorific titles which the Greek-speaking Christians of the early centuries conferred upon the founder of their religion was the phrase, "Iesos Christos Theoi Ousion Soter." In English, this means "Jesus Christ, God's Son, Saviour." The initial letters of the pious phrase spell out "Ichthos," which is the Greek word for fish.

So the Sign of the Fish became the equivalent of the Sign of the Cross among the persecuted hidiers in the catacombs. If you met a stranger, and thought he might be one of the brother-

hood, you scrawled a rough tracing of a fish on the ground, or even gestured it in the air. It was a sure means of identification, and less dangerous to use than the Cross, which the pagan enemy knew too well.

This fish symbolism became all the more firmly fastened in early Christian practice because so many of the early disciples, including St. Peter himself, had been fishermen, and because fish figured so often and prominently in the treasured New Testament to which the catechumens listened, often at the risk of their lives.

The later-originating practice of eating fish on Friday has no direct connection with this symbolic significance of the fish. The Church imposed abstinence from the flesh of warm-blooded animals (mammals and fowl) on that day in commemoration of the shedding of its Founder's blood on Friday. But the flesh of cold-blooded animals was still permitted. And because fish abounded along the seacoasts, as well as in the rivers that flowed past inland cities, it was only natural that the most frequently used of these "Friday meats" should be fish.

Science News Letter, August 22, 1936

MINERALOGY

Meteorites Contain Large Amounts of Rare Metals

DISCOVERY of notable amounts of the rare metals, gallium and germanium, in the earth's only imports from outer space, the meteorites that fall from the sky, was announced by Dr. Arthur S. King of the Carnegie Institution's Mt. Wilson Observatory in a paper presented to the Society for Research on Meteorites.

Emphasizing the usefulness of spectroscopic analysis instead of the regular chemical and mineralogical methods for determining the elements present, Dr. King found that iron meteorites have some 19 elements within them, including in largest quantities iron, nickel, cobalt and copper.

In spectroscopic analysis, the different kinds, colors, wavelengths or spectral lines of light are viewed or photographed and studied. Each element when heated intensely flies its own kind of light "flag." The larger the amount of the element present, the more intense is the brightness of the spectral line.

The rare metals gallium and germanium in meteorite samples produce very distinct spectrum lines, Dr. King explained. While they are widely distributed in earthly rocks, they occur in very small quantities.

Unlike irons of the earth, iron meteorites are almost free from chromium and manganese. Another interesting fact is that traces of silver are present and those from Meteor Crater in Arizona give the silver spectrum in considerable strength.

Stony meteorites are quite different in composition from the iron ones, although they contain a large percentage of iron. Dr. King suggests that their iron explains why the stony ones are not entirely consumed by heat when they smash into the earth's atmosphere.

A large amount of sodium is a striking feature of stony meteorites as analyzed by the spectroscope. There is nearly as much magnesium in them, and Dr. King suggests that their high content of this metal, which burns with a bright flame, accounts in large measure for the spectacular features of meteoric falls that are seen over large areas.

Science News Letter, August 22, 1936

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Economics

CREATE THE WEALTH—William Beard—*Norton*, 314 p., \$3. A thoughtful inquiry into our limping social mechanism. Our increasingly technical society makes possible abundance which somehow does not arrive. Mr. Beard, who by the way is son of those contemporary historians, Charles A. and Mary Beard, suggests how the profit system and production for use can be combined in an experimental program for creating wealth. Good reading for enlightening and appraising the political and other programs of the moment or the year.

Science News Letter, August 22, 1936

Entomology

THE CANNIBALISTIC HABITS OF THE CORN EAR WORM (U.S.D.A. Tech. Bull. No. 499)—George W. Barber—*Govt. Print. Off.*, 19 p., 5c. See page 117.

Science News Letter, August 22, 1936

English

SPEECH CONSTRUCTION—Frederick W. Bond—*Christopher*, 146 p., \$2. This book, though small, includes brief discussion of many aspects of speech construction and delivery, and also a considerable amount of illustrative material.

Science News Letter, August 22, 1936

Library Science

LIBRARIES OF WASHINGTON—David Spence Hill—*American Library Association*, 296 p., \$3.50. This comprehensive study of the library facilities of the capital city particularly stresses the field of education; the study was conducted under the auspices of the American Council on Education. Two hundred and sixty-nine libraries are described, containing a total of about 13,000,000 volumes.

Science News Letter, August 22, 1936

Archaeology

AN INTRODUCTION TO PAWNEE ARCHAEOLOGY—Waldo Rudolph Wedel—*Govt. Print. Off.*, 122 p., 12 pl., 10 maps, 30c. Although primarily intended to bring together what is known about the Pawnee from archaeological research, this report includes the traditions and history of the tribe.

Science News Letter, August 22, 1936

Linguistics—Ethnology

GOSPEL LIGHT—George M. Lamsa—*A. J. Holman Co.*, 401 p., \$2.75. Dr. Lamsa, a native Assyrian, has taken up the task of clarifying obscure passages

in the New Testament by showing what they mean today in Aramaic, the language spoken by Christ and his disciples. So little have figures of speech and old sayings and ideas changed, that Assyrians who speak Aramaic have preserved "the background of Bible culture." Dr. Lamsa explains most interestingly several hundred of the famous Biblical allusions, arranging them so that they can be easily found, in reference hunting.

Science News Letter, August 22, 1936

Chemistry

IX CONGRÈS INTERNATIONAL DE CHIMIE PURE ET APPLIQUÉE, Volume V, *Chimie Biologique Pure et Appliquée*, 359 p., Volume VI, *Chimie Analytique*, 381 p., Volume VII, *Chimie Agricole*, 252 p.—*IX Congreso Internacional de Química Pura y Aplicada*, Madrid.

Science News Letter, August 22, 1936

Psychology

SOCIAL PSYCHOLOGY—Ellis Freeman—*Henry Holt*, 491 p., \$2.50. In this work by the professor of psychology at the University of Louisville, the emphasis is on the study of social values.

Science News Letter, August 22, 1936

Education

STREAMLINE YOUR MIND—James L. Mursell—*J. B. Lippincott Co.*, 254 p., \$2. In this readable book by an educator of Teachers College, Columbia University, you may find some inspiration and helpful hints for improving the efficiency of your own mental activity. It should be especially useful for the college student.

Science News Letter, August 22, 1936

Archaeology

THE TROYVILLE MOUNDS, CATAHOULA PARISH, LA.—Winslow M. Walker—*Govt. Print. Off.*, 73 p., 16 pl., 20c. Excavations of the great mound at what was very probably the Indian capital Anilca, visited by De Soto. The story of the mound's construction, started by people of culture resembling Ohio's Hopewell Mound-builders, is traced through several stages.

Science News Letter, August 22, 1936

Biology

HOW WE CAME BY OUR BODIES—Charles B. Davenport—*Henry Holt*, 401 p., \$3.75. It is rare to find a book which explains at once so clearly and so entertainingly as this one does the development of the human egg into grown man or woman; genes and heredity; the formation of the body tissues; and evolution. The book reads as easily and pleasantly as a novel. There are numerous drawings, diagrams and photographs illustrating the text, and a glossary-index will help out the lay reader when he comes to unfamiliar terms.

Science News Letter, August 22, 1936

Child Psychology

INFANT BEHAVIOR—Mandel Sherman, Irene Sherman and Charles D. Flory—*Johns Hopkins*, 107 p., \$1.50. Although published as one of the *Comparative Psychology Monographs*, this research concerns the human infant, who, the investigators find, is as yet an animal sub-cortically dominated.

Science News Letter, August 22, 1936

Astronomy

INFLUENCE OF PLANETARY CONFIGURATIONS UPON THE FREQUENCY OF VISIBLE SUN SPOTS—Fernando Sanford—*Smithsonian Institution*, 5 p., 5c.

Science News Letter, August 22, 1936

Ethnology

CHEYENNE AND ARAPAHO MUSIC—Frances Densmore—*Southwest Museum*, 111 p., \$1. To the many Indian tribes whose music she has studied, Miss Densmore has now added two more. Seventy-two songs are recorded and analyzed in this report, thus preserving some of the old native American music of the great plains, handed down through generations by chiefs, warriors, and medicine men.

Science News Letter, August 22, 1936

Vocational Guidance

OCCUPATIONS AND VOCATIONAL GUIDANCE: A SOURCE LIST OF PAMPHLET MATERIAL—Wilma Bennett—*H. W. Wilson Co.*, 123 p., \$1.25. Second edition, revised.

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